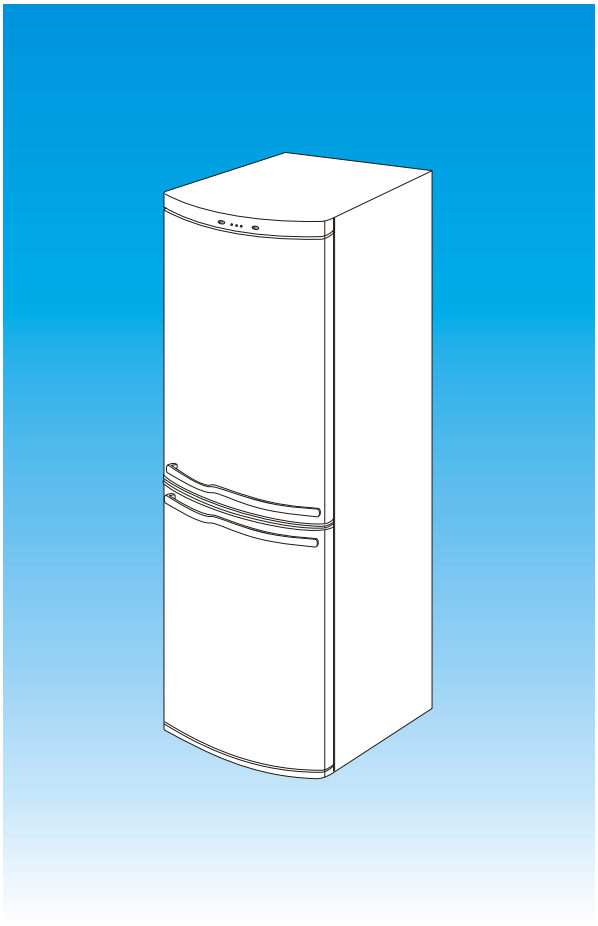
SAMSUNG

MODEL:
RL-28FBSW
RL-28FBSI

SERVICE MANUAL

REFRIGERATOR



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1.PRECAUTION

1-1. Safety precautions

Only qualified service technicians who are thoroughly familiar with the refrigerating cycle and the required safety checks should perform service operations in accordance with specified guidelines.

1 -1-1. Prior to servicing, be sure to disconnect the product from its electrical power source by removing the products eletrical plug from the wall receptacle to preclude the possibility of resultant presonal injury and / or property damage.

1-1-2. Never attempt to modify or bypass circuit connections in ways not recommended by the manufacturer.

1-1-3. Do not use any extension or double adaptors.

1-1-4. For person safety, this appliance must be properly grounded.
This refrigerator should not be grounded with a telephone line, gas pipe etc.

1-2. Servicing precautions

1 -2-1. In case of article No.1 and starting capacitor (itself only) do not supply power in order to check for eletrical charge and discharge for more than two minutes. When power is supplied for more than two minutes, the insulation inside the capacitor may be broken. When it is impossible to finish the test within two minutes, wait for about 30 minutes, and then check again.

1-2-2. When replacing the relay connected to the compressor terminal pin, be sure to pull it off straight and push it on straight, Swaying of the relay side-to-side or up and down, may cause damage to the compressor terminal pin and / or the relay.

1-2-3. Wait more than 5 minutes to re-start the refrigerator after you stop it once.
If you plug in the refrigerator immediately after you pull the plug, you may not be able to start it again.

⚠ : This is safety-related information on the A/ C power circuits and parts used in the refrigerator.

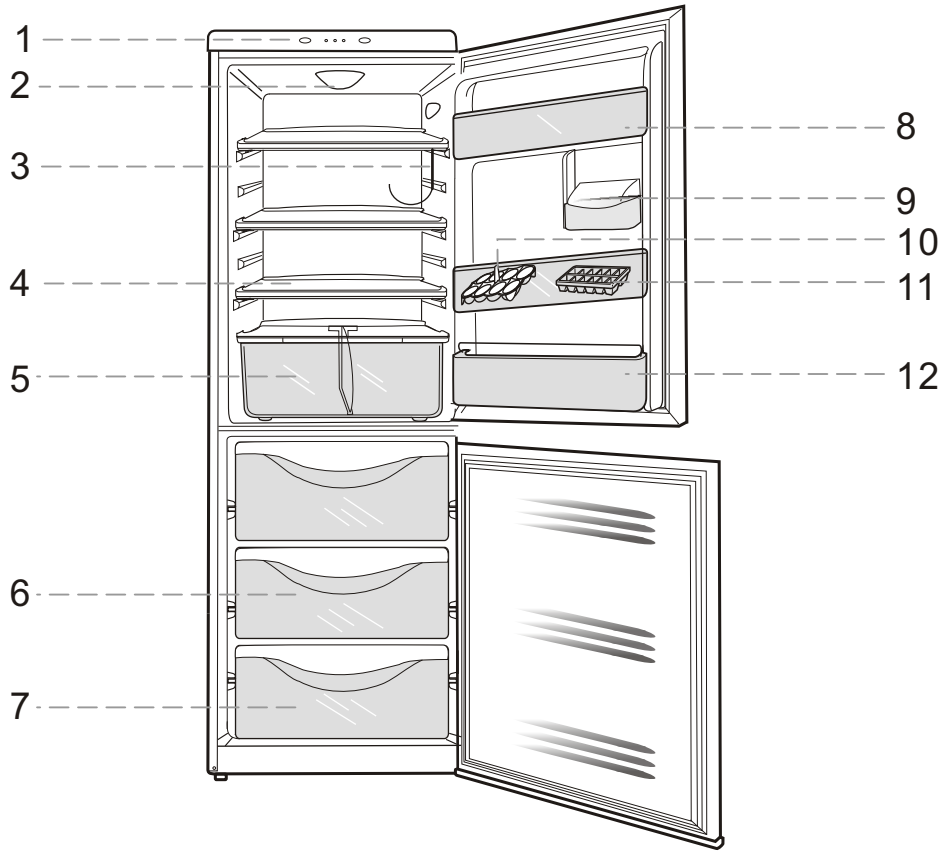
☞ : This is the information required for repairing the refrigerator.

2.PRODUCT SPECIFICATION

Model		RL28FBSW RL28FBSI
Type		Two door refrigerator & freezer
Power supply		AC 220V~50Hz
Capacity	Total	247L
	Refrigerator	167L
Overall dimensions (mm)	Width	550
	Depth	664
	Height	1750
Refrigerant(Sealed volume:g)		HFC-134a(160g)
Temperature control		Mechanical(Thermostat)
Insulation material		Polyurethane Foam(141b)
Door Seal		Magnetic gasket
Liner		ABS
Acces–sories	Door Storage(Option)	1Guard-Bottle,1 Guard Variety,2Guard-Egg,1Tray Ice,1Tray Egg
	FreezerStorage	2 Assy Tray Upp,1 Assy Tray Low
	Ref Storage	3 Assy Shelves,1 Assy Tray Veg,1Guard wine
	Printed Matter	Owner's Manual,Label

3.STRUCTURE

3-1.DESCRIPTION OF COMPONENTS



1. TOP TABLE & PANEL PCB

2. ASSY LAMP

3. GUARD WINE

4. ASSY SHELF

5. CASE VEGETABLE

6. ASSY TRAY UPP

7. ASSY TRAY LOW

8. GUARD EGG

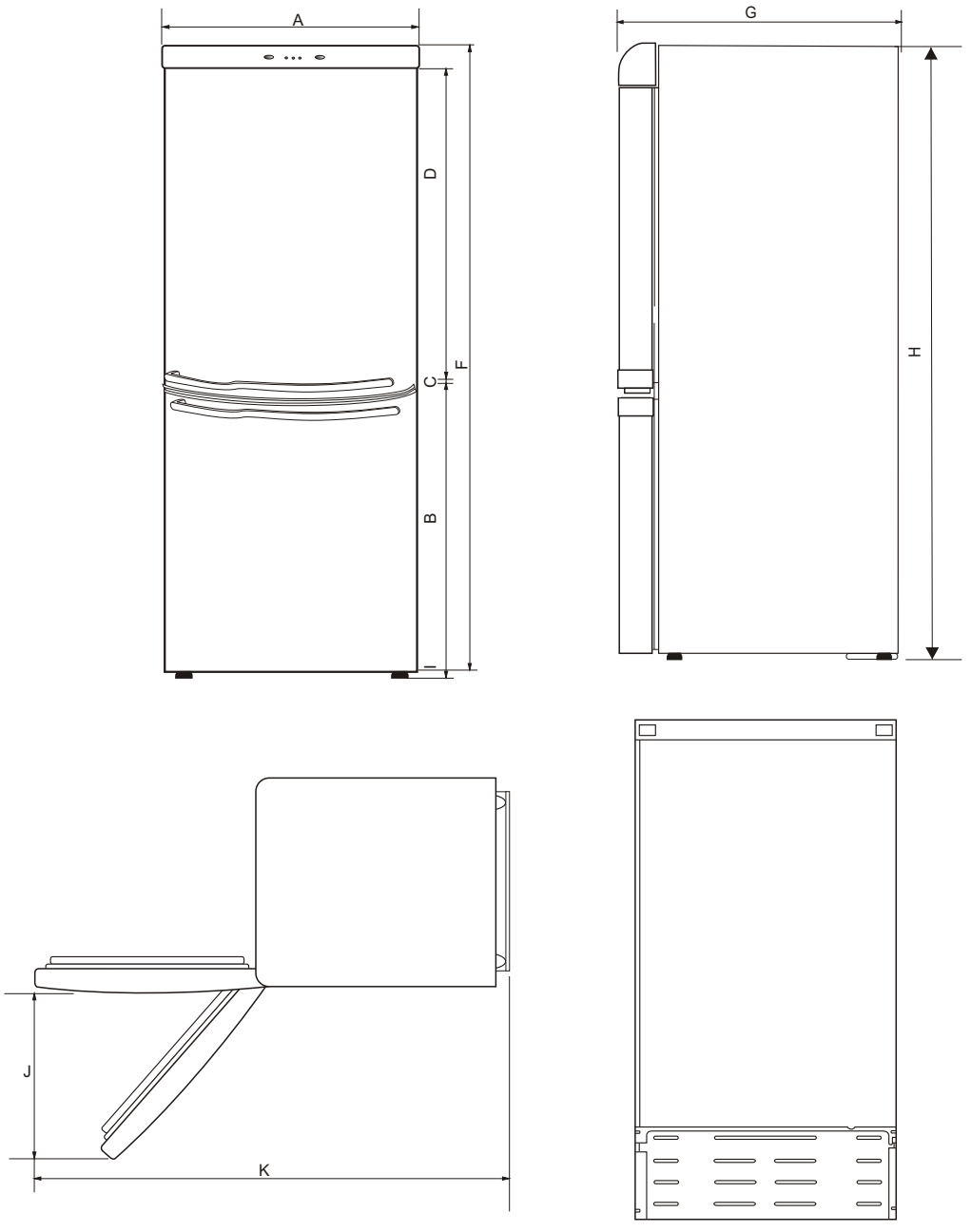
9. GUARD VARIETY

10. TRAY EGG

11.TRAY ICE

12. GUARD BOTTLE

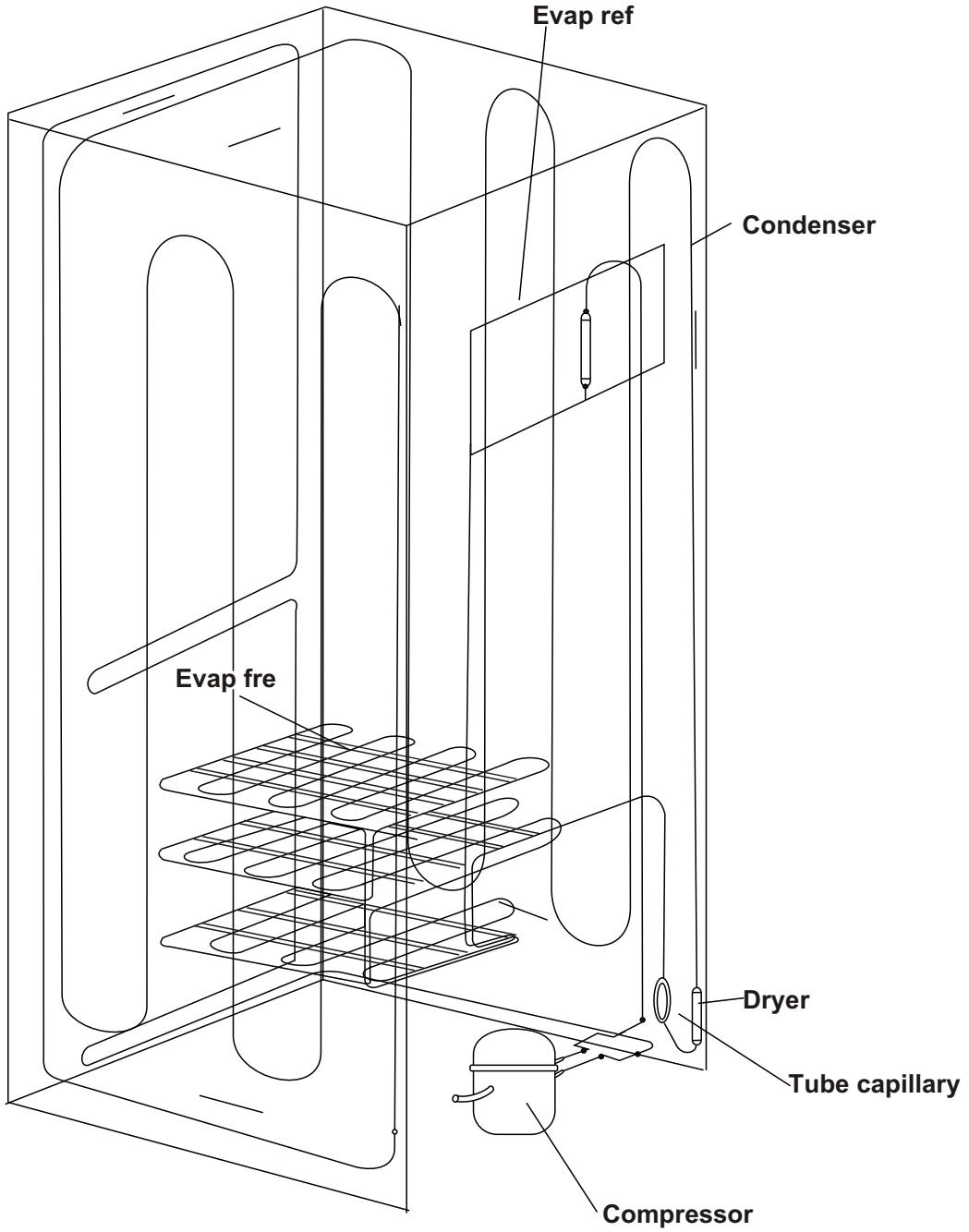
3-2.PRODUCT INSTALLATION



MODEL	A	B	C	D	F	G	H	I	J	K
RL28FBSW	550	671	9	979.5	1711	664	1750	39	392	1094.76
RL28FBSI	550	671	9	979.5	1711	664	1750	39	392	1094.76

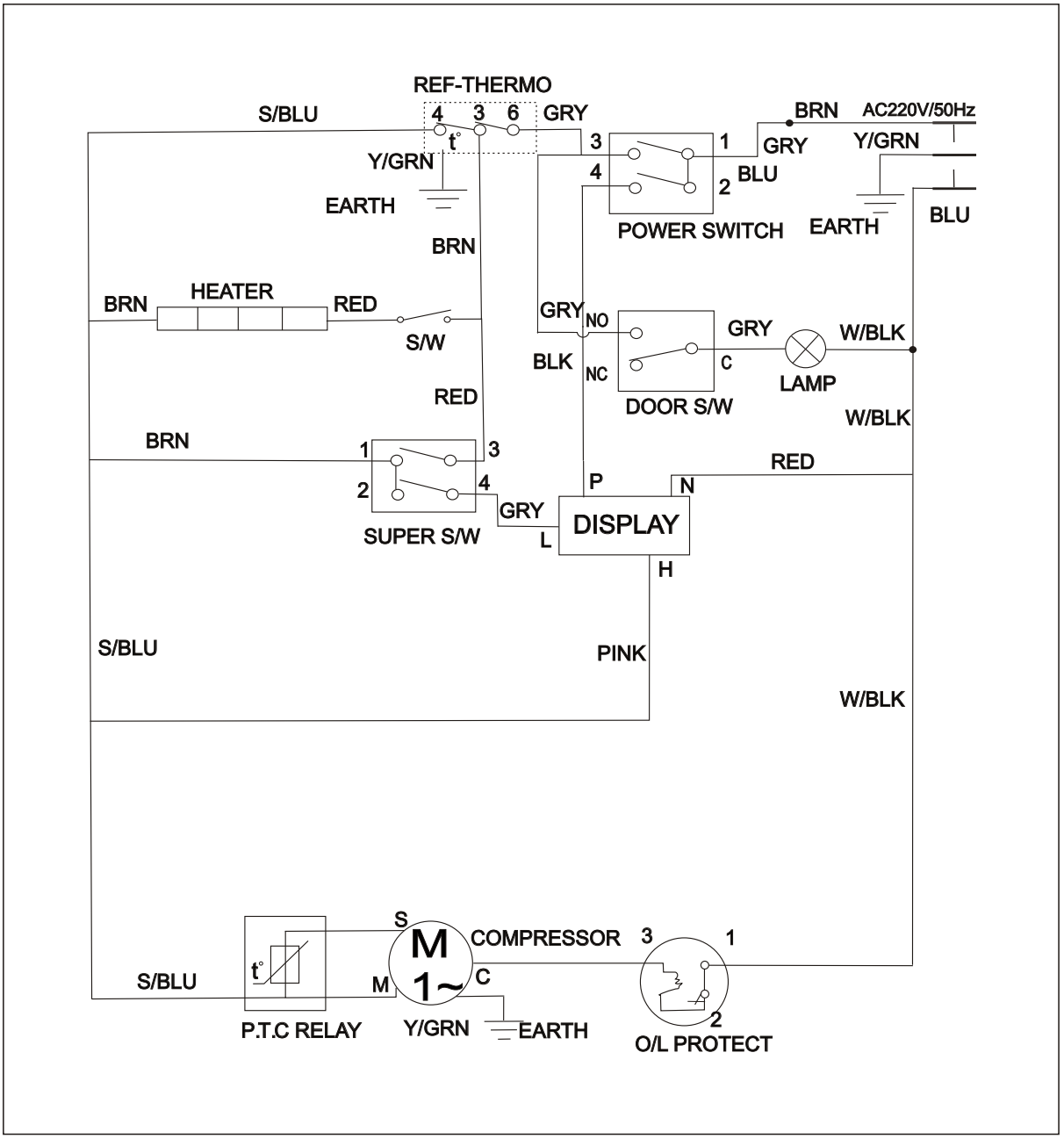
4.CIRCULATION OF REFRIGERANT

4-1.Circle of refrigerant



5.SCHEMATIC DIAGRAM

5-1.Circuit Diagram

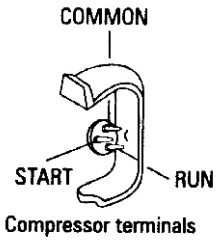
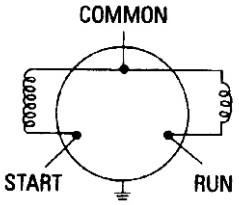
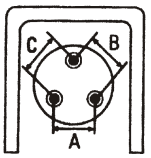
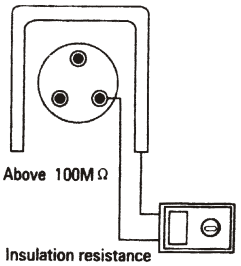


6.SPECIFICATIONS OF MAJOR FUNCTIONAL PARTS

ITEM	SOURCE		AC 220V~50Hz
REFRIGERATION CYCLE	COMPRESSOR	MODEL	QB66C
		OUT PUT/STARTING TYPE	165W/RSIR
	EVAPORATOR		FIN TYPE
	CONDENSER		CLUSTER
	DRYER		MOLECULAR SLEVE
	CAPILLARY TUBE		Ø1.8*0.62*3500
	REFRIGERANT(g)		R-134a 160g
ELECTRICAL PARTS	THERMOSTAT		WDF29
	POSISTOR		8EA503
	OVERLOAD P ROTECTOR	MODEL	MM3-23GC
		CLOSE TEMP/OPEN TEMP	61±8℃/120±5℃

7.OPERATING PRINCIPLE OF MAJOR COMPONENTS, AND INSPECTION METHOD

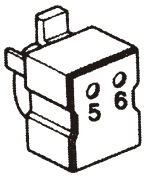
7-1.Compressor Motor

Operating principle	Inspection method
The compressor motor, mounted directly to the compressor and located inside a sealed steel case, has two windings. One is a start winding and the other a run winding. The windings are connected together internally, forming a common connection. A lead is connected to each of the windings, and to the common connection. These three leads are then connected to glass-sealed terminals that extend through the compressor case. The terminals are clustered in al trangle (pyramid) pattern and, reading from left to right, are identified: Start, Common and Run.  Compressor terminals  Compressor Windings	1) Measure the resistance of each winding of the compressor. a. Disconnect the power cord. b. Remove the relay from the compressor. C. Measure the resistance of each winding. A. The highest resistance value is the measurement of the "start" and "run" terminals whose windings are connected in series. B. The lowest resistance value is the measurement of the "run" and "common" terminals. C. The mid-level resistance value is the measururement of the "start" and "common" terminals. B + C = A  2) Measure each terminal and ground with the ohmmetor set to the highest range. If a winding is found to be either open or shorted to ground, the compressor has failed.  Insulation resistance

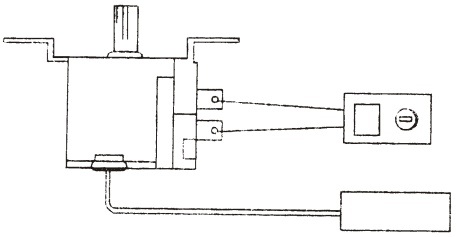
7-2 Overload Protector

Operating principle	Inspection method
The overload protects the compressor motor by responding to both the temperature and current. The overload protector is basically made up of a set of the contacts normally closed and the bimetal element. The overload, mounted externally and in direct contact with the compressor case, is connected in series with both windings of the motor. If the motor fails to start for any reason, the heavy locked rotor current will cause the bimetal element to heat which then quickly flex, snapping the contacts open and interruption current flow through the motor. Likewise, if the motor overheate to an unsefe leval, the comination of current and temperature will cause the bimetal to snap the contacts open, On cooling, the bimetal flex back and snaps the contacts closed. The motor will continue to cycle on the overload so long as the oriqinal reason for tripping persists	1) Check for continuity with ohmmetor. - If the overlosd is tripped, cheak continuity after waiting until it has cooled, in the room ambient before checking. - Even though the continuity of the overload is observed it is difficult to confirm that the overload is operating within the specification limits. If there is any doubt, replace it with a part with identical specifications. ⚠ : An overload should NEVER be by-passed in the circuit , not even as a temporary measure until the proper replacement can be installed.

7-3.Relay

Operating principle	Inspection method
The relay momentarily energizes the start winding to start the rotation of the compressor motor. Most later refrigerator models use a solid state type relay. Unlike the mechanical type relay, the solid state relay has no coil and no moving contacts. This relay consists of a small solid state wafer that has a low resistance at room temperature. The wafer is positioned between electrical terminals that connect to the compressor terminals.  As voltage is initially applied to the compressor circuit, current flows through the run winding and, in parallel, through the relay and start winding . Initially , the resistance of the relay is low enough to pass sufficient current through the start winding and permit the compressor to start. Then, instantaneously, the resistance of the relay goes high-in effect, reducing the current flow through the relay to a trickle . This trickle current causes the resistance of the relay to remain high , thus keeping the relay "open". This type of relay is called a PTC(positive temperature coefficient) relay because the resistance goes high as the temperature increases. The solid state relay can be tested for continuity, using an ohmmeter. The measured resistance of the relay, at room temperature, should be within 10% of the value stated on the schematic wiring diagram for the particular model.	

7-4.Temperature Control

Operating principle	Inspection method
A temperature control is used on all refrigerators and freezers to regulate the operation of compressor and thus maintain desired food temperatures. The temperature control consists primarily of a capillary and billows assembly , a set of normally closed contacts, and a mechanical linkage. Pressure within the gas- charged capillary tube and billows assembly responds to temperature sensed at the sensing bulb. Rising temperature causes the pressure to increase and expand the accordion-type billows. The expanded billows actuates the linkage which allows contracts to close. When the temperature drops , the billows contacts due to a decrease in pressure and the snap-action of the linkage opens the contacts.	Put the probe of the ohmmetor to the terminal of the temperature control, and check for the opening and closing of the contacts by turning the knob ON and OFF. 

8.HOW TO REPLACE MAJOR COMPONENTS

8-1. REFRIGERATION CYCLE

COMPRESSOR: In evaporator liquid refrigerant is so expanded to absorb heat around evaporator that compressor sucts refrigerant in low temperature and low pressure and then compresses it to gaseous refrigerant in high temperature and high pressure which will be discharged to outside.

CONDENSER: Gaseous refrigerant in high temperature and in high pressure so radiates evaporation latent heat absorbed from evaporator surrounding during passing through condenser and compression heat due to refrigerant gas compression to surrounding of condenser that refrigerant becomes liquid in high pressure.

DRYER: In order to prevent that moisture and foreign substances resided inside every parts during refrigeration cycle assembling is so included among refrigerant gas that it chokes the exit of inlet of capillary, dryer has drying substances (molecular sieves) and filter inside it which absorbs or purify them.

Capillary tube: Regulates and/or keeps(in specified low)refrigerant flow rate so that maintains constant pressure drop from wire condenser to evaporator.

Evaporator: Liquid referigerant passed through capillary so expand in evaporator that it becomes low temperature and low pressure to absorb heat around evaporator, so that it chills surrounding air and at that time liquid refrigerant becomes gaseous.

HEAT EXCHANGE BETWEEN SUCTION TUBE AND CAPILLARY TUBE:

Liquid refrigerant in high temperature passing through capillary tube so changes heat between low temperature on suction tube and then more lowers liquid refrigerant temperature at just before expansion so that increases its enthalpy to result big refrigeration efficiency at last.

Refrigerant gas in low temperature passing through suction tube so exchanges heat between liguid refrigerant high temperature passing through capillary that it becomes more hith temperature condition and then it becomes compete gaseous so that increase compression efficiency of compressor.

THERMOSTAT: Mounted inside the refrigerator to regulate the temperature of refrigerator.

STARTING RELAY: When motor starts running owing to sub winding interrupts of current simultaneously.

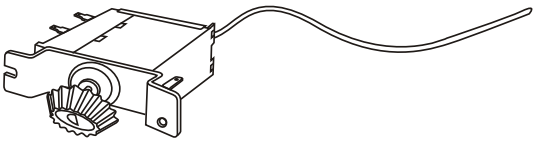
OVERLOAD PROTECTOR: When circuit is overheated, it is cut off to prevent compressor wind burn-out.

8-2. Steps for replacing thermostat,

1) Take off the screws fastening the lamp box.

2) Take off the screws fixing the capillary tube.

3) Take off the thermostat.



8-3. Steps for replacing relay,

1) Take off the cover of relay by removing the fastener.

2) Take off the relay by pulling it right hand.

8-4. Steps for replacing door panel,

1) Remove the screws fastening the door panel.
   Then, door panel can replaced.

8-5. Steps for replacing compressor evaporator unit,

1) The compressor and evaporator are not united in these models and cannot be taken off-together.
   Cut them into two units at joint with a weider or a cutter.
   Then, take them out separately.

9. TROUBLE - SHOOTING

9-1. Compressor does not run at all (Does not cool at all)

Cause	What to be checked	Correction
Temperature control set to position "OFF"	Check control knob setting	Turn the control to "COLD"(MAX) position.
Erroneous plug cord inserting	Check plug cord inserting	Insert plug cord into outlet correctly.
Fault relay assembly.	Check conduction of overload relay.	Replace if overload relay is not conductive.

9-2. Compressor does not run normally

Cause	What to be checked	Correction
Source power voltage	Check power voltage is within ±10% of rating.	If voltage is below rated value, contact utility company.
Starting voltage	Check starting voltage.	If starting voltage drops below - 10% of rating, contact utility company and have household wiring capacity increased.

9-3. Compressor runs normally but inside temprature does not drop at all.

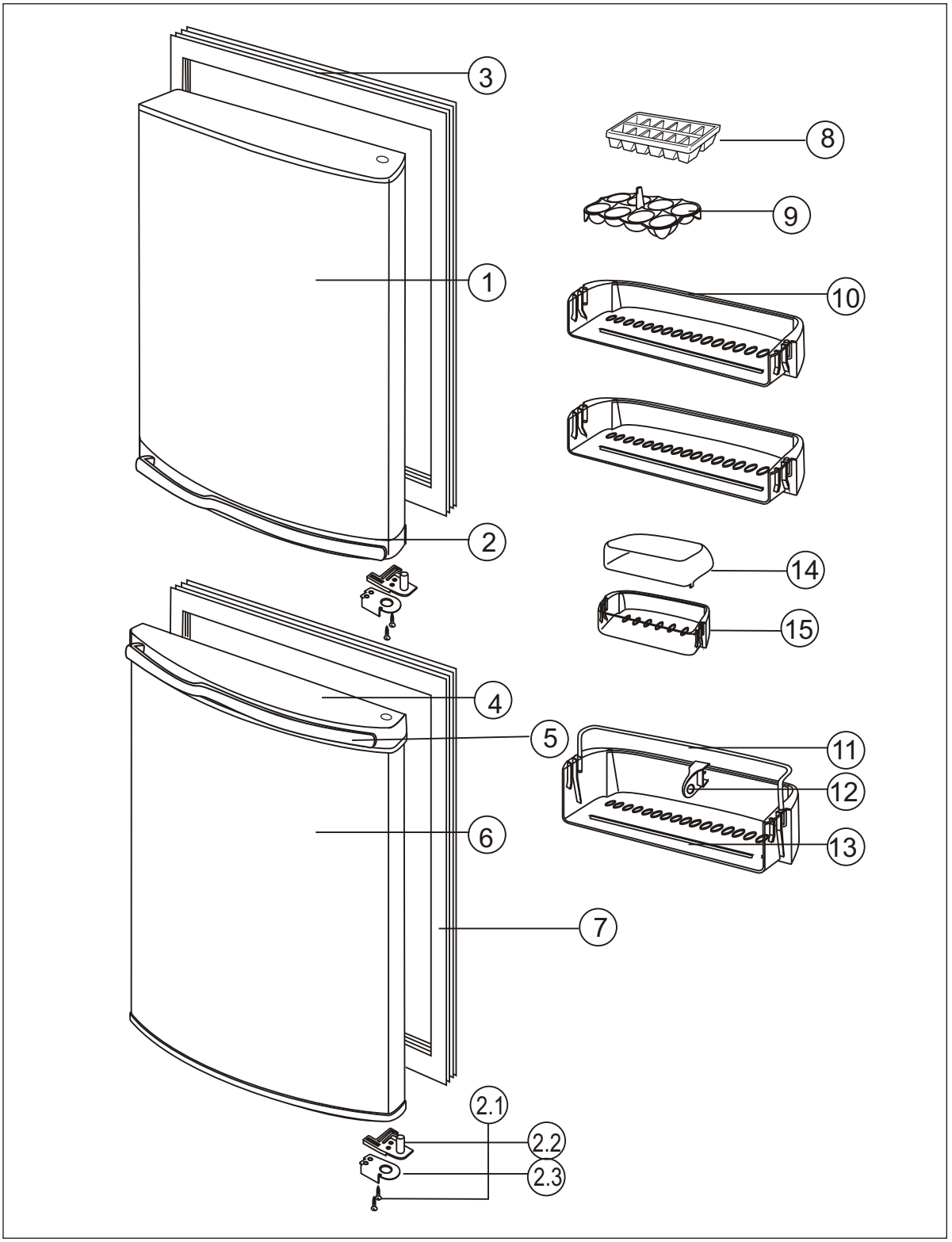
Cause	What to be checked	Correction
Faulty compressor-evaporator unit.	After continuing operation for over 20minutes, let a drop of water fall onto evaporator and see if it becomes frozen.	Replace Compressor-evaporator unit.

9-4. Compressor runs normally but inside temprature does not drop at a sufficiently low level.

Cause	What to be checked	Correction
Erroneous temperature control setting.	Check control knob setting.	Set control to "COLD" and continue operation for over 20 minutes. If temperature fails to drop, do following.
Faulty thermostat	Short-circuit thermostat terminals and continue operation for over 20minutes . If temperature drops, thermostat is faulty.	Replace thermostat. (If thermostat is not faulty, compressor-evaporator unti is in trouble).
Gaps between door and cabinet.	Check for gaps between door packing and cabinet.	Loosen door panle screws and correct distortion of door.
Frosting on evaporator.	Check for excessive frosting on evaporator. (This will deteriorate refrigerating efficiency).	Defrost before frost grows more than 10mm thick.

10.EXPLODED VIEW AND PARTS LIST

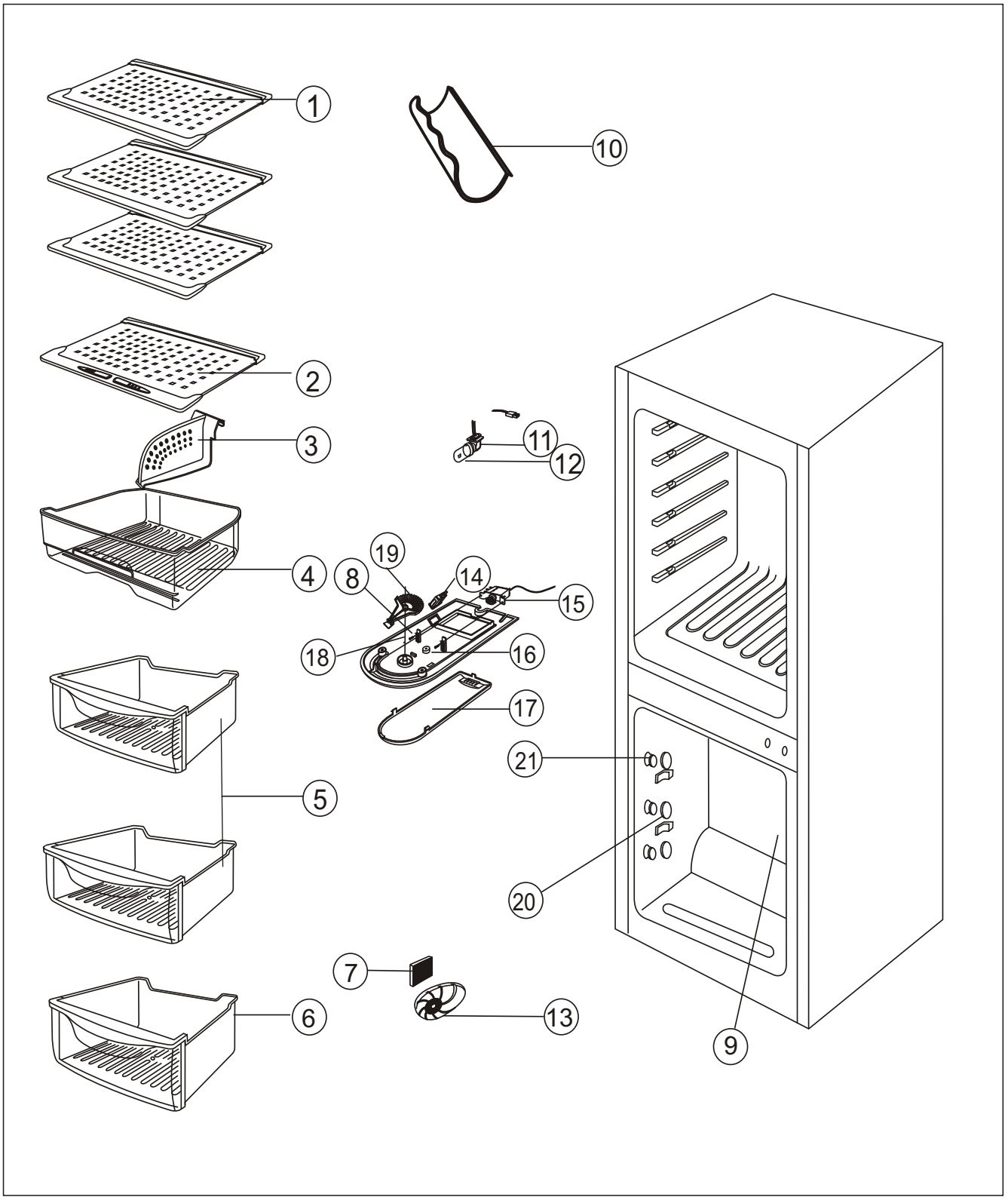
10-1.DOOR PARTS



10-2. PARTS LIST-DOOR

No	Part number	Description	Q'ty	Spec	Remark
1	DA91-01726J	ASSY DOOR FOAM REF	1	RL28FBSW, SC-9752	RL28FBSW
	DA91-01726B	ASSY DOOR FOAM REF	1	RL28FBSI1, SILVER	RL28FBSI
2	DA97-00529E	ASSY CAP DOOR	2	RL24MBSW, ABS, -, -, -, SC	RL28FBSW
	DA97-00529B	ASSY CAP DOOR	2	BCD-191NS, ABS, -, -, -, G	RL28FBSI
2.1	6002-001103	SCREW-TAPPING	4	BH, +, GB845-85, M3.5, L1	
2.2	DA61-00406A	STOPPER DOOR-A	2	BCD-182, POM, -, -, -, A2	RL28FBSW
	DA61-00406E	STOPPER DOOR-A	2	BCD-191NS/202NS/211N	RL28FBSI
2.3	DA71-40133A	STOPPER-DOOR, C	2	SCP1, T2.0, ZPC3(W)	RL28FBSW
3	DA63-00688A	GASKET DOOR REF, ASSY	1	245N, 500*861, S	RL28FBSI
	DA63-00688C	GASKET DOOR-REF	1	BCD-246NS/231WNS, SO	
4	DA67-00343J	CAP DOOR-UPP, REF	2	RL24MBSW, ABS, -, -, -	RL28FBSW
	DA67-00343G	CAP-DOOR UPP, REF	1	BCD-246NS/231WNS, A	RL28FBSI
5	DA67-00461E	CAP DOOR	2	RL24MBSW, ABS, -, -, -, SC-9752	RL28FBSW
	DA67-00461C	CAP-HANDLE	2	BCD-202NS/211NS, ABS, -, -	RL28FBSI
6	DA91-01725H	ASSY DOOR FOAM FRE	1	RL28FBSW, SC-9752	RL28FBSW
	DA91-01542B	ASSY DOOR FOAM FRE	1	BCD-246NS, -, -, -,	RL28FBSI
7	DA63-00687A	GASKET DOOR FRE, ASSY	1	245N, 500*681, S	RL28FBSW
	DA63-00687C	GASKET DOOR-FRE	1	BCD-246NS, SOFT-PVC,	RL28FBSI
8	DA67-40317B	TRAY-ICE	1	PP, NTR, C-PJT	
9	DA66-00115A	TRAY-EGG	1	PP, BCD-210N, SKY-BLUE	
10	DA63-00501B	GUARD-EGG	2	GPPS, BCD-210N, SILK	
11	DA63-00504B	GUARD	1	MSWR10, BCD-210N	
12	DA71-00229A	GUIDE-BOTTLE	1	PP, BCD-210N, SKY/BLUE	
13	DA63-00502B	GUARD-BOTTLE	1	GPPS, BCD-210N, SILK	
14	DA63-00550A	COVER-GUARD	1	BCD-230WN, 245N, GPPS	
15	DA63-00551A	GUARD-VARIETY	1	BCD-230WN, 245N, GPPS	

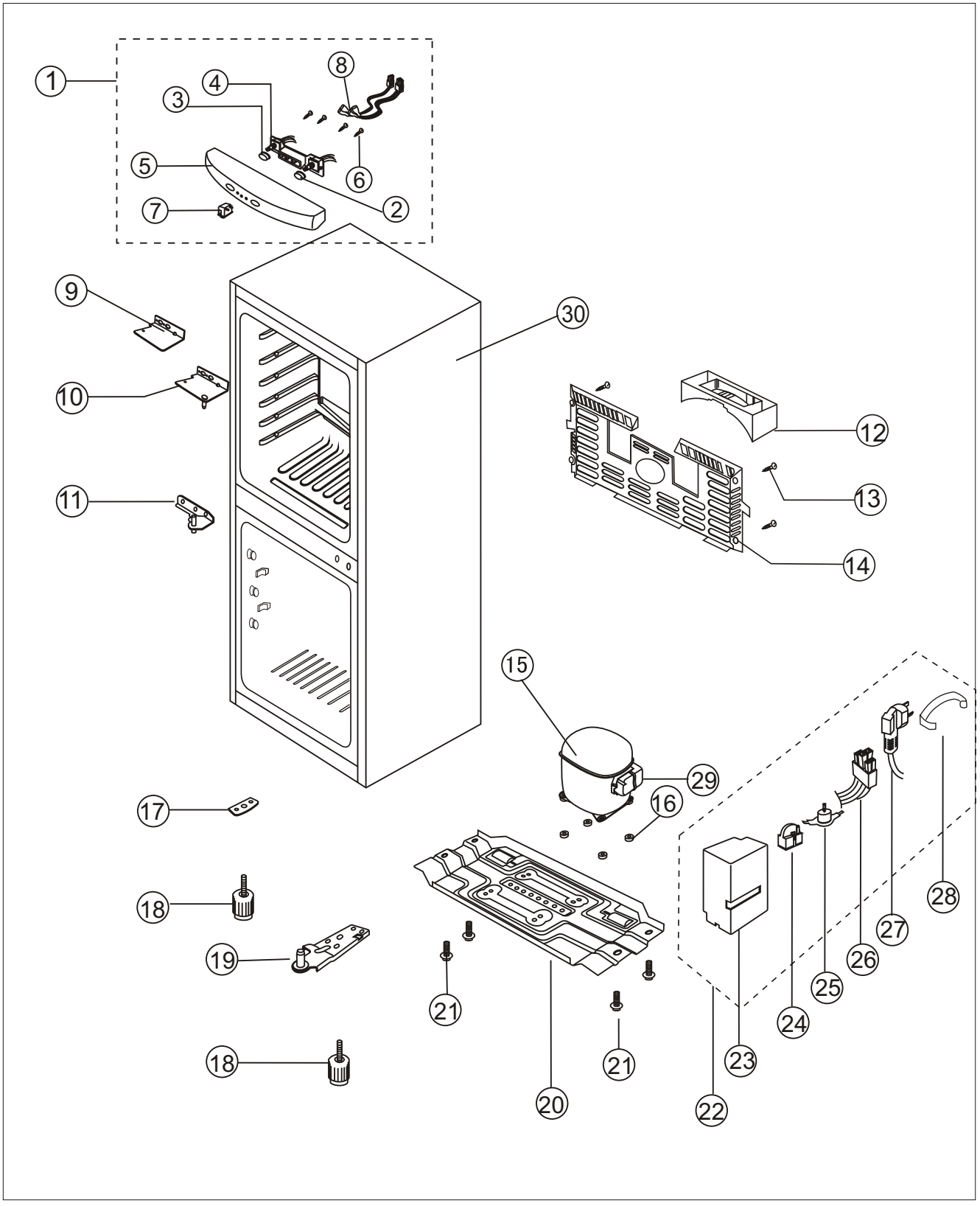
10-3.REF & FRE PARTS



10-4. PARTS LIST-REF & FRE

No	Part number	Description	Q'ty	Spec	Remark
1	DA67-00352A	ASSY-SHELF	3	PP+GLASS, BCD-210N	
2	DA63-00498A	ASSY-COVER, VEG	1	PP+GLASS, BCD-210N	
3	DA71-00228A	GUIDE-TRAY, VEG	1	PP, BCD-210N, SKY/BLUE	
4	DA66-00114B	TRAY-VEGETABLE	1	GPPS, T2.7, BCD-210N, S	
5	DA97-00813B	ASSY-TRAY FRE, SECOND	2	RL28FBSW, PP+GP	
6	DA97-00814B	ASSY-TRAY FRE, THIRD	1	RL28FBSW, PP+GPP	
7	DA02-90106K	CATALYST	1	W40L40T10, PD, MN, CU	
8	DA67-00335H	CASE THERMO	1	RL28MBSW1/BUS, ABS, -, -, -	
9	DA59-00212A	EVAP ASSY-FRE	1	BCD-245N, -, AL, -, -, -, -	
10	DA63-01027A	GUARD-WINE	1	NEW-COMBI, HIPS, T2, -, -, W9	
11	DA39-20362D	WIRE-LEAD, THERMO	1	220V/50HZ, BCD-190	
12	DA47-40121B	LAMP	1	E14/25*17, 240V/15W	
13	DA67-00341H	CASE PURIFIER	1	RL24MBSW1/BUS, ABS, -, -	
14	DA34-00012A	SWITCH-HEATER	1	PA66	
15	DA47-00060A	THERMOSTAT	1	WDF28L, 220V/50HZ, BCD-190	
16	DA64-00257A	KNOB-JUNCTION	1	NYLON66, WHITE, BCD-190	
17	DA63-00495A	COVER-LAMP, THERMO	1	MIPS, BCD-190	
18	DA67-00335H	CASE THERMO	1	RL28MBSW1/BUS, ABS, -, -, -	
19	DA64-00256A	KNOB-THERMO	1	ABS, W9540, BCD-190	
20	DA66-00117A	ROLLER-TRAY, OUTOR	6	PA66, BCD-210WN, 21	
21	DA66-00116A	ROLLER-TRAY, INNER	6	PA66, BCD-210WN, 21	

10-5. CABINENT PARTS



10-6. PARTS LIST-CABINENT

No	Part number	Description	Q'ty	Spec	Remark
1	DA97-01376F	ASSY COVER-TOP FRONT	1	RL28FBSW,ENGLI	RL28FBSW
	DA97-01376D	ASSY COVER-TOP FRONT	1	RL28FBSI,ENGLI	RL28FBSI
2	DA64-00305B	BUTTON-R	1	BCD-191,ABS,-,-,CR,-	
3	DA64-00304B	BUTTON-L	1	BCD-191,ABS,-,-,CR,-	
4	DA41-00084A	PCB-PANEL,ASSY	1	BCD-190	
5	DA64-00302N	TOP TABLE-C	1	RL24MBSW,ABS,SC-97527,-	RL28FBSW
	DA64-00302M	TOP TABLE-C	1	RL26MBSL,ABS,SILVER,-,-	RL28FBSI
6	6002-001106	SCREW-TAPPING	2	TH,+,SJ2823-87,M3.5,L	
7	DA34-00018A	SWITCH	2	BCD-190	
8	DA39-00172A	WIRE-HARNESS,PCB	1	220V/50HZ,BCD-190	
9	DA61-00157A	HINGE-UPP,L	1	SCP1,T3,BCD-210,210WN	
10	DA61-00160A	HINGE-UPP,R	1	SCP1,T3,BCD-210,210WN	
11	DA61-00403A	HINGE-MID	1	BCD-182,SCP1,4,-,-,-,-,ZP	
12	DA66-00085A	TRAY-DRAIN WATER	1	FOR ZEL,PP,BCD-218	RL28FBSW
	DA66-00085E	TRAY DRAIN-WATER	1	BCD-191NS/202NS/21	RL28FBSI
13	DA60-10130B	SCREW-TAP,TH	5	1-4.2X13,FE,FZY(1018)	
14	DA63-11155B	COVER-COMP	1	PP,H-PJT,SH-6W-251B	RL28FBSW
	DA63-11155F	COVER COMP	1	BCD-191NS/202NS/211N,PP,	RL28FBSI
15	DA59-00203B	COMPRESSOR	1	QB66C,ENGLISH,220V,50HZ,	
16	DA63-00610A	GROMMET COMP	4	NBR,BLK,H17.5 FOR QB66	
17	DA71-10440A	REINF-LEG,L	1	SCP1,T3.0,ZPC3(YEL)	
18	DA61-30105C	LEG-FRONT	2	ABS,V-P(NEW)	
19	DA61-00404A	HINGE-LOW	1	BCD-182,SCP1,3,-,ZN(YELLO	
20	DA71-00230A	CHASSIS-COMP	1	SBHG1,BCD-210WN,210N	
21	DA60-10124A	SCREW-TAP TITE	4	ZPC2-Y 6X16 SR-53EA	
22	DA97-00281C	ASSY-CASE JUN	1	RL28,MID-ASIA,-,-	
23	DA67-00340A	CASE-JUNCTION	1	ABS####,BCD-210N	
24	DA35-00028A	PTC RELAY	1	-,FORQB66C PTH7M330MC1	
25	DA34-00023A	O/L PROTECTOR	1	FOR QB66C,MM3-23GCF	
26	DA39-20346D	WIRE-HARNESS,RELAY	1	220V/50HZ,BCD-19	
27	DA39-00196A	CBF	1	SSEC-REF,UCP2,250V/16A,2-PIN,L2	
28	DA61-00200A	CLAMPER -O/L	1	FOR QB66C	
29	DA63-00617A	COVER RELAY	1	NORYL,BLACK,FOR QB66C	
30	DA90-00578F	ASSY CABINET FORM	1	RL28FBSW,MM,SC-97	RL28FBSW
	DA90-00578E	ASSY CABINET FORM	1	RL28FBSI1,MM,SILV	RL28FBSI